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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,661	02/06/2001	Glenn H. Rankin	10003011-1	5477

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AGILENT TECHNOLOGIES
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EXAMINER	
CHANG, AUDREY Y	
ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 04/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/778,661	RANKIN ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- Th MAILING DATE of this communication appears on the cover sh t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-8, 9-16, and 18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims fail to teach why would a **non-concave reflector** particular with **convex** outer surface is capable of **focusing** light. Conventionally, a non-concave reflector, including planar or convex reflector, will **not** be able to focus light. This fact is well explained in any standard optics textbook. Clarifications are required. Claims 2, 4-8, 10, and 12-16 inherit the rejection from their respective based claims.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "that reflects off of the reflector back upon itself" recited in claim 1 is confusing and indefinite since it is not clear what does this phrase mean.

The phrase "the first non-concave means for reflecting ... including means for focusing the light reflects off the first non-concave means" recited in claim 9 is confusing and indefinite since it is not clear what is the relationship between the means for focusing and the reflection of the light from the non-concave means. It is also not clear how does the outer layer recited in claims 10 and 12 relate to the means for focusing.

Claims 2-8 and 10-16 inherit the rejections from their respective claims.

5. **Claims 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.** The omitted steps are: the connecting step between the step of "reflecting" and the step of "focusing". The two steps have no logical relationships to each other this renders the scopes of the claims unclear.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1-2, 9-10, 17 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Scifres et al (PN. 4,815,084).**

Scifres et al teaches a *resonant optical cavity* (Figure 7) that is comprised of a *first non-concave reflective facet* (172) and a *region* (160), serves as the *outer layer*, having a *convex surface* at one end of the cavity that together sever as the *first non-concave reflector* and a *second non-concave reflective facet* (174) and a *region* (164), serves as a second outer layer, having a convex surface at a second end of the

cavity that together serve as the *second non-concave reflector*. The regions or outer layers (160 and 164) having a *convex surface* are forming a pair of *converging lenses* for *focusing* light reflects off the first and second reflective facets (172 and 174), (please see Figure 7 and column 8). The regions or outer layers as shown in Figure 7 also have a *thickness that varies* as a function of radial distance out from an axial center of the layers.

This reference has therefore anticipated the claims.

8. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by the patent issued to Colbourne (PN. 5,666,225).

Colbourne teaches a *multi-pass etalon filter* and *method for filtering light* wherein the light is *reflected* between *a pair or reflectors* (12 and 14) and is *focused* by a *gradient index lens* (34) that by definition is made of material having an *index of refraction varies* as a function or radial distance from the axial center of the lens, (please see Figures 1-2 and columns 2-3).

This reference has anticipated the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3, 11, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Scifres et al.

The *resonant optical cavity* taught by Scifres et al as described for claims 1, 9 and 17 above has met all the limitations of the claims. Scifres et al teaches that the non-concave reflector comprise a region or outer layer (160 or 164) having a convex surface that forms a converging lens however this reference does not teach explicitly that the convex surface is *semispherical*. However lens with semispherical surface or known as spherical lens are quite well known in the art to replace the converging lens of Scifres with one would have been obvious to one skilled in the art for the benefit of obtaining desired optical converging characteristics. Scifres et al shows that the region or outer layer (160 or 164) has a *planar* inner surface, (please see Figure 7).

11. Claims 4-5, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Scifres et al in view of the patent issued to Colbourne.

The *resonator optical cavity* taught by Scifres et al as described for claims 1 and 9 above has met all the limitations of the claims. Scifres et al teaches that the non-concave reflector has a region with a convex surface that serves as a converging lens but it does not teach that the region is formed by a layer material having an index refraction that varies as a function of radial distance from the axial center. However gradient index lens or grim lens having variable refractive index is quite well known in the art as demonstrated by the teachings of Colbourne wherein a gradient index lens (34) having planar shape is used to focus light. It would then have been obvious to one skilled in the art to use a gradient index lens as an alternative lens arrangement for providing convergence of the light in the optical cavity.

12. Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Scifres et al in view of the patent issued to Scobey (PN. 5,786,915).

The *resonator optical cavity* taught by Scifres et al as described for claims 1 and 9 above has met all the limitations of the claims. Scifres et al does not teach explicitly that the reflective facets are

formed as interference stacked filter. However interference reflector with alternatively arranged quarter wave layers stack is extremely well known in the art as demonstrated by the teachings of Scobey. Scobey teaches an optical cavity having a pair of reflectors (94 and 98 Figure 6) wherein each of the reflectors has alternatively arranged layers (90 and 92, Figure 6) having a quarter wavelength thickness for each of the layers. It would then have been obvious to one skilled in the art to make the reflective facets of Scifres et al with the interference reflector arrangement for the benefit of further allowing a design to select the desired wavelength of light to be reflected.

13. **Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Scifres et al in view of the patent issued to Colbourne.**

Scifres et al teaches a *resonant optical cavity* (Figure 7) having a *first non-concave reflective facet* (172) and a *region* (160), serves as the *outer layer*, having a convex surface at one end of the cavity that together sever as the *first non-concave reflector* and a *second non-concave reflective facet* (174) and a *region* (164), serves as a second outer layer, having a convex surface at a second end of the cavity that together serve as the *second non-concave reflector*. The regions or outer layers (160 and 164) having a convex surface are forming a pair of converging lenses for focusing light reflects off the first and second reflective facets (172 and 174), (please see Figure 7 and column 8).

This reference has met all the limitations of the claims with the exception that it does not teach that the region is formed by a layer material having an index refraction that varies as a function of radial distance from the axial center. However gradient index lens or grim lens having variable refractive index is quite well known in the art as demonstrated by the teachings of Colbourne wherein a gradient index lens (34) having planar shape is used to focus light. It would then have been obvious to one skilled in the art to use a gradient index lens as an alternative lens arrangement for providing convergence of the light in the optical cavity.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patents issued to Perilloux et al (PN. 5,151,917) and Kaneda et al (PN. 5,349,603) each teaches an optical cavity with non-concave reflectors.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.
April 3, 2002